



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/024,958	12/18/2001	Melisa Buie	AMA/4213.P1/ETCH/METAL/JB	3439

32588 7590 10/20/2003

APPLIED MATERIALS, INC.
2881 SCOTT BLVD. M/S 2061
SANTA CLARA, CA 95050

EXAMINER

CHEN, KIN CHAN

ART UNIT	PAPER NUMBER
----------	--------------

1765

DATE MAILED: 10/20/2003

10

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/024,958

Applicant(s)

BUIE ET AL.

Examiner

Kin-Chan Chen

Art Unit

1765

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-24 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-24 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 6,8.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. Claims 3-6, 11, 12, 15, and 22 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 11 recites the limitation "increasing the oxygen content" in line 1. There is insufficient antecedent basis for this limitation in the claim.

Claims 3-6, 15, and 22 are indefinite for use of improper language. It is unclear as to the scope of the claims. The examiner suggests replacing "selected from the group of " with "--selected from the group consisting of--".

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1-5 and 7-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Meyer et al. (US 4,600,686; hereinafter "Meyer").

Art Unit: 1765

Meyer teaches a method for processing a photolithographic structure. A structure may be positioned in a processing chamber. The structure may comprise a metal photomask layer formed on a silicon-based substrate and a patterned resist material deposited on the metal photomask layer. A processing gas comprising carbon monoxide and the chlorine containing gas may be introduced into the chamber. The carbon monoxide and the chlorine containing gas may have a molar ration between about 1:9 and about 9:1. The power may be delivered to the processing chamber to generate a plasma. The exposed portions of the metal photomask layer may be removed. The metal photomask may comprise chromium. The substrate may be a transparent silicon based material (e.g., quartz). The processing gas may comprise oxygen. The processing gas may comprise an inert gas. See Figs. 1 and 2; col. 3, lines 3-25.

Because Meyer teaches the structure being processed comprises a metal photomask layer formed on a silicon based substrate and a patterned resist material deposited on the metal photomask layer. Therefore, it would have been obvious to one with ordinary skilled in the art that the reticle is included because it is one of the most popular photolithographic tool having said structure in the semiconductor device fabrication.

Dependent claims 7-10 differ from Meyer by specifying various compositions (e.g., ratios of the etching gases), processing parameters (such as claims 9 and 10). However, They are commonly determined by routine experiment. The process of conducting routine optimizations so as to produce an expected result is obvious to one

Art Unit: 1765

of ordinary skill in the art. In the absence of showing criticality it is the examiner's position that a person having ordinary skill in the art at the time of the claimed invention would have found it obvious to modify Meyer by performing routine experiments (by using various compositions and different processing parameters) to obtain optimal result in order to provide their art recognized advantages and produce an expected result.

4. Claims 6 and 13-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Meyer et al. (US 4,600,686; hereinafter "Meyer") in view of Kornblit et al; hereinafter "Kornblit").

Meyer teaches a method for processing a photolithographic structure. A structure may be positioned in a processing chamber. The structure may comprise a metal photomask layer formed on a silicon-based substrate and a patterned resist material deposited on the metal photomask layer. A processing gas comprising carbon monoxide and the chlorine containing gas may be introduced into the chamber. The carbon monoxide and the chlorine containing gas may have a molar ration between about 1:9 and about 9:1. The power may be delivered to the processing chamber to generate a plasma. The exposed portions of the metal photomask layer may be removed. The metal photomask may comprise chromium. The substrate may be a transparent silicon based material (e.g., quartz). The processing gas may comprise oxygen. The processing gas may comprise an inert gas. See Figs. 1 and 2; col. 3, lines 3-25.

Art Unit: 1765

Because Meyer teaches the structure being processed comprises a metal photomask layer formed on a silicon based substrate and a patterned resist material deposited on the metal photomask layer. Therefore, it would have been obvious to one with ordinary skill in the art that the reticle is included because it is one of the most popular photolithographic tools having said structure in the semiconductor device fabrication.

Unlike the claimed invention, Meyer does not teach that the chlorine gas may be used in the processing gas. In the method of etching chromium or chromium-containing compound that can be used for rectiles, Kornblit (abstract; col. 2, lines 11-20) teaches that oxygen and chlorine may be used. Hence, it would have been obvious to one with ordinary skill in the art to modify Meyer by using chlorine gas as taught by Kornblit in order to produce uniform layer with good etching selectivity.

Claims 13-24 differ from Meyer by specifying various compositions (e.g., ratios of the etching gases), processing parameters (such as claims 13,16-20, 23, and 24). However, They are commonly determined by routine experiment. The process of conducting routine optimizations so as to produce an expected result is obvious to one of ordinary skill in the art. In the absence of showing criticality, it is the examiner's position that a person having ordinary skill in the art at the time of the claimed invention would have found it obvious to modify Meyer by performing routine experiments (by using various compositions and different processing parameters) to obtain optimal result in order to provide their art recognized advantages and produce an expected result.

Art Unit: 1765

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kin-Chan Chen whose telephone number is (703) 305-0222. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nadine Norton can be reached on (703) 305-2667. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306. Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-2934.

K. C. Chen

Kin-Chan Chen
Primary Examiner
Art Unit 1765

October 3, 2003

K-C C